

**REMARKS**

Applicants respectfully solicit favorable reconsideration followed by Notice of Allowance after entry of this Amendment.

**Claims Presented**

Applicants present claims 1-3, 5-7 and 9-12. Applicants included the molecular weight range from claim 4 in claim 1 and the molecular weight range of claim 8 in claim 5. These amendments do not raise a new issue, do not present new matter, and do not increase the numbers of claims presented for review.

**Rejoinder of Claims 9-12 is in Order**

Applicants respectfully submit claims 9-12 can and should be considered with claims 1-3 and 5-7. The method claims relate to the composition and therefore there is no undue search burden. The Office Action does not provide factual basis for the requirement for restriction that satisfies the two-part standard of 35 U.S.C. §121. Claims 9-12 should be re-joined and should not have been restricted out.

**Rule 133 Statement**

Applicants' legal representative acknowledges the Examiner's courtesies during a telephone discussion conducted on June 23, 2006. The presentation of amended claims was discussed. It was suggested the cited references did not disclose the number average molecular weight range of about 2,000 to about 20,000, such as in former claims 4 and 8. It was suggested the cited Hasegawa and Okazaki references referred to a broad molecular weight range (up to

million) and did not disclose the range claimed. Applicants' specification at page 8 was also discussed and it was noted that neither reference indicated any awareness of the molecular weight ranges disclosed or the attributes associated with such ranges.

**The Claims Define Novel Inventions Over the Hasegawa Reference.**

Applicants respectfully submit their claims 1-3 and 5-7 define novel inventions over the Hasegawa et al. reference, U.S. Patent No. 6,559,231.

Applicants submit that when fairly considered, Hasegawa does not describe the claimed inventions.

Applicants respectfully submit, *arguendo*, that the Examiner's parsing of Formula (1) to include the four general cases; namely, (i) R1=H and R2=H, (ii) R1=alkyl and R2=alkyl, (iii) one of R1 and R2 is H whilst the other is alkyl, and (iv) R1 and R2 form a carbon ring together does not show anticipation or obviousness. The Examiner contends Hasegawa discloses a curing type water base resin composition which comprises a copolymer (I) obtained by copolymerizing an ethylenically unsaturated monomer (a) having a maleimide group and other ethylenically unsaturated monomers (b) and (c). Examiner contends in page 4 of the office action that Hasegawa discloses, in column 2, lines 40-50, Formula (1) wherein R1 and R2 each represent independently a hydrogen atom or an alkyl group, illustrating the presently claimed invention. It thus appears from the Office Action that the Examiner opines the Hasegawa reference teaches the same copolymer and thus inherently anticipates. Office Action, page 4.

Applicants courteously submit the rationale for the rejection is factually mis-placed and they respectfully solicit both its reconsideration and withdrawal of the rejection.

Anticipation requires that the claimed invention be described in a single prior art reference. That standard is not met in this case.

**1. The reference does not describe the present molecular weight ranges.**

Claims 1 and 5 include a molecular weight range that is not described in the Hasegawa reference. Instead of describing or suggesting the claimed range, Hasegawa appears to disclose that the maleimide copolymer (I) has a number average molecular weight falling in a range of usually 1,000 to 1,000,000 (*see* col. 7, lines 9-12). The range in Hasegawa is of such breadth as to be analogous to the well-grounded principle that a chemical genus does not anticipate an unnamed species, nor render it obvious. Atofina v. Great Lakes Chemical Corp., 78 U.S.P.Q.2d (BNA) 1417, 1424 (Fed. Cir. 2006) (In *reversing* the trial court's ruling of anticipation for a narrower range encompassed within a very broad generic range, the court said "there may be many species encompassed within a genus that are not disclosed by a mere disclosure of the genus."); In re Baird, 16 F.3d 380, 29 U.S.P.Q.2d (BNA) 1550, 1552 (Fed. Cir. 1994) ("The fact that a claimed compound may be encompassed by a disclosed generic formula does not by itself render that compound obvious."); In re Jones, 958 F.2d 347, 350, 21 USPQ2d 1941, 1943 (Fed. Cir. 1992) (rejecting Commissioner's argument that "regardless [ ] how broad, a disclosure of a chemical genus renders obvious any species that happens to fall within it").

In Hasegawa, the exemplified copolymers for coating agents produced in Production Examples 1-5 (see column 18, Table 1) are produced by emulsion polymerization, and thus are usually considered high in molecular weight in the order of 500,000 to 1,000,000 in terms of number average molecular weight, which does not describe the number average molecular weight range of about 2,000 to about 20,000. *See, e.g., Atofina, supra.*

Consequently, the claimed range of about 2,000 to about 20,000 is neither described by Hasegawa nor would it have been suggested by the reference.

**2. The reference teaches solid materials, not liquid materials.**

As mentioned above, Hasegawa exemplifies solid materials, not liquid materials. Hasegawa appears to disclose that the maleimide copolymer (I) has a number average molecular weight falling in a range of usually 1,000 to 1,000,000 (*see* col. 7, lines 9-12), but the maleimide copolymers disclosed in the working examples of Hasegawa are all solid at ordinary temperature. Contrariwise, in the present invention the claimed compound having maleimide groups is liquid at ordinary temperature. *See, e.g.*, specification, page 35, last paragraph. The description of a solid material does not describe, and thus does not anticipate a different liquid material.

To repeat the discussion from the prior Amendment, the glass transition temperature (T<sub>g</sub>) of the maleimide copolymers (I) which are described in the Production Examples of Hasegawa can be calculated on the basis of Table 1 of column 18, as shown below:

Calculation method of T<sub>g</sub>:

$$1/T_g = C_A/T_{gA} + C_B/T_{gB} + \text{-----} + C_X/T_{gX}$$

in which C<sub>A</sub>, C<sub>B</sub> ---- and C<sub>X</sub> are weight fractions of components A, B ---- and X respectively, provided that C<sub>A</sub> + C<sub>B</sub> + ---- + C<sub>X</sub> = 1, and T<sub>gA</sub>, T<sub>gB</sub> ---- and T<sub>gX</sub> are T<sub>g</sub>s (°K) of homopolymers of components A, B ---- and X respectively.

The calculated T<sub>g</sub>'s of the copolymers A-1, A-2, A-3 and A-4 of Table 1 of Hasegawa are as follows:

	Constituent monomers (parts)						Tg (°C)
	MIA	DAA	BMA	MMA	BA	MA	
A-1	10	5	50	20	14	1	26.6
A-2	10	10	45	20	14	1	29.1
A-3	10	5	50	20	14	1	26.6
A-4	10	0	55	20	14	1	24.1

MIA: Imide acrylate of formula (11) of Hasegawa (65°C (338°K)),

DDA: Diacetoneacrylamide (77°C (350°K)),

BMA: n-Butyl methacrylate (20°C (293°K)),

MMA: Methyl methacrylate (105°C (378°K)),

BA: n-Butyl acrylate (-54°C (219°K)),

MA: Methacrylic acid (130°C (403°K)).

Apparently from the above Table, the Tg's of the copolymers A-1, A-2, A-3 and A-4 of Hasegawa are all near ordinary temperature. Thus, it appears that the copolymers of the working examples of Hasegawa are not liquid at ordinary temperature.

**3. The reference exemplifies coating agents, not energy beam curable adhesive compounds/compositions.**

Hasegawa describes a broad genus of copolymer (I), but actually only concretely discloses only a copolymer (I) that contains the maleimide group falling under the single case in which R1 and R2 form a ring, and that such exemplified copolymer is a high molecular weight solid, not a liquid at ordinary temperature. Therefore, even if, *arguendo*, the present invention is within the general case (iii), then the evidence of record shows that the Hasegawa reference leads in a direction away from the claimed inventions. Specifically, Hasegawa only exemplifies the case (iv) in the working Examples (see column 18, Formula (11)) for coating agents even though Hasegawa generally discloses various applications (see column 16, lines 24-32). The present specification addresses an embodiment of the present invention in Examples 1-11, and deals with the structurally divergent copolymer (Hasegawa, case (iv)) at page 42 of the present specification in the Comparative Example 1. The evidence presented in Applicants' specification shows that:

their exemplified embodiment (Examples 1-11) is superior to the Hasegawa embodiment (case (iv), Comparative Example 1) in SAFT (shear adhesion failure temperature), which is important for pressure sensitive adhesives (see page 47, Table 1 of the present specification). This result would not have been foreshadowed by the Hasegawa reference.

On the other hand, the present compound has maleimide groups represented by formula (1), has a number average molecular weight of about 2,000 to about 20,000 and is liquid at ordinary temperature. Such features are not described by Hasagawa.

The present compound is not described in Hasegawa and is therefore novel.

**Claims 1-3 and 5-7 Define Novel Inventions over the Okazaki Reference.**

Applicants submit their claims 1-3 and 5-7 define novel inventions over the Okazaki reference, U.S. Patent No. 6,645,617 B1.

The Examiner contends Okazaki discloses a pressure sensitive adhesive composition curable with active energy beams which comprises a copolymer obtained from an ethylenically unsaturated monomer having a maleimide group and another ethylenically unsaturated monomer, and a pressure sensitive adhesive sheet formed of the above composition on a substrate.

Applicants' position is that the definition of R1 and R2 of Okazaki does not necessarily disclose the case in which R1 is hydrogen and R2 is an alkyl as in the present formula (1), nor does it disclose the present claimed compound represented by Formula (1) that is liquid at ordinary temperatures and has a number average molecular weight of about 2,000 to about 20,000 is novel.

However, Okazaki generally discloses a Formula (1) in which R1 and R2 can be an alkyl group, but does not specifically exemplify a compound of the present Formula (1) in which

either of R1 and R2 is hydrogen as claimed in the present application. See, col. 2, line 33 through col. 3, line 33 of Okazaki. Applicants also point out that Okazaki discloses a broad range of molecular weight between 10,000 and 1,000,000 (see column 5, lines 45-52). Okazaki also apparently discloses the broad range as a weight average molecular weight not number average molecular weight range. Okazaki concretely discloses the number average molecular weight (Mn) of the copolymers obtained in the working examples (see column 12, Table 1). However, the number average molecular weight (Mn) of the copolymers obtained in the Okazaki working examples ranges 40,000 to 52,000, which does not describe or suggest the molecular weight range of the present invention. Thus, the present invention is not anticipated by Okazaki.


Having addressed all matters, Applicants earnestly, but respectfully, solicit favorable reconsideration and a Notice of Allowance.

Respectfully submitted,

FITCH, EVEN, TABIN & FLANNERY

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